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14. ABSTRACT

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Technology Integration in a Southern Inner-City School: Perspectives of In-service and Pre-

service Teachers

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Abstract

The use of technology in teacher education has been demanded by The National Council for Accreditation of Teacher Education (NCATE) in six NCATE Unit Standards, strengthened by its partnerships with higher education institutions and K-12 grade schools. Issues with technology use in K-12 schools have been identified and discussed in the literature. With policies derived under "Title I" designed to implement the No Child Left Behind Act of 2001 (NCLB) for disadvantaged students, Title I schools are receiving the resources needed to gain access to technology that assists teaching and learning. But Title I has also set standards that require recipients to address the effectiveness of technology in the classroom for educating inner-city students, including the training of teachers to use this technology safely and effectively. The purpose of the chapter is to examine the use of technology in education by looking at the practices of technology integration in a southern elementary school in South GA in the USA through a qualitative study guided by our theories of constructivism and cognitive dissonance in learning. The findings of the study revealed first that innovation is necessary when technology was integrated into the curriculum for inner-city students' learning with greater success; and second, that the availability of technology for these students far outpaced the training of the teachers who must use technology in inner-city classrooms. Further, we found strong support for cognitive dissonance in learning.

Technology Integration in a Southern Inner-City School: Perspectives of In-service and Pre-

service Teachers

Introduction

The infusion of technology into education is not new, but its effectiveness in inner city

schools remains a challenge. Technology-use related issues in schools have been identified and

discussed by Caspary, Kusserow, Lavin, and Moveaasaghi (1999), such as efficiency,

management, budgetting, funding, and professional development. Still, the use of technology in

teacher education has been demanded by The National Council for Accreditation of Teacher

Education (NCATE) in its six NCATE Unit Standards, strengthened by its partnership between

higher education institutions and K-12 schools (NCATE, 2008; K-12 stands for kindergarten to

12th grade in high-school). However, aligning the integration of technology with NCAET

standards raises several questions: How are the resources for technology being used or misused?

How does the availability of new technology in inner-city school systems factor into improving

the academic achievements of these disadvantaged students? and, Are there best practices in the

use of this technology that can help close the achievement gap between suburban and inner-city

students? In this chapter, we approach these questions through a case-study of the practices used

by teachers in an inner-city elementary school in South GA.

Background

The inner-city school Y in the study is located in X County,[1] which is one of the lower

ranking counties in terms of K-12 education and one of the counties with a diverse population in

GA. The County enrolled more than 32,000 students and it ranks 156th of the 164 school districts

in the state of GA. Over 45% of the residents in the county are from minority backgrounds.

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[1] We use symbols to keep all names anonymous; our study was approved by our school's IRB.

African Americans in the county population are over 30%, 2.5 times the national average (US Census Bureau, 2012).

School Y is a K-5 elementary school with an enrollment of 500 students and with 90% being African Americans, 8% European Americans, and 2% Hispanics. The school employed about 35 teachers and 20 staff workers. A majority of the teachers were African Americans.

Of those teachers who participated in the research study, four were in-service (veteran) teachers and female--two of these were European Americans and two were African Americans. There were four pre-service teachers, all of whom were African Americans, one being male and three females.[2]

We used a qualitative approach (Glaser & Strauss, 1967). Interviews were the main means to collect data for the study. All interviews were conducted in the Fall 2011 school term on school Y's site. Each interview lasted about fifteen to twenty minutes. Interviews were semi-structured. In addition to interview data, other data collected included the researcher's observation notes, reflections, and internet resources. The interview data were coded to protect the identity of the participants.[3] Interview data were transcribed and checked by interviewees for accuracy. The constant comparative method was used to code emerging themes and patterns (Patton, 2002).

In alignment with the qualitative approach, the study used constructivism as its theoretical framework. Constructivism is a theoretical view of teaching and learning (Educational Broadcasting Corporation (EBC), 2004)). It emphasizes the active participation of the learner in the learning process to construct his/her understanding of concepts. In addition,

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[2] Pre-service teachers are college students who have declared their major to be Education, but they have not been licensed as professional (in-service, veteran) teachers.

[3] For example, for a fictional first interviewee notionally named "I.M.A. Fiction", we would have used I1 for Interviewee #1.

from our theory of cognitive dissonance and learning, active ownership of new ideas and concepts is necessary to overcome the reluctance to reject incorrect, out-dated, or inferior ideas (Lawless et al., 2010). The knowledge building process is the knowledge construction process (EBC).

The traditional approach is a one-size that fits all. Its success has been uneven with inner-city students for several reasons. The traditional approach has not been able to engage students adequately due to a lack of cultural relevancy, low retention rates of knowledge, and passive engagement of students in the learning process. Inner-city children come from non-traditional backgrounds with many different needs that call for constructive methods and strategies of teaching and learning to more actively engage them in the learning process.

What is needed for inner-city students is an approach like constructivism that has been able to produce students with the skills needed to be successful in the 21st Century, including the technology skills that are essential to compete for jobs in a global market. Educators (Banks, 2008; Bennet, 2011; Kauchak & Eggen, 2011) believe that to teach inner-city students effectively, teachers need to use instruction based on student strengths. Furthermore, the integration of technology into instruction enhances learning, motivation, and more parental involvement (Intel, 2010; Johnson, 2008; Jansen, 2011).

Literature Review

The integration of technology with coursework will provide classroom experiences that prepare students with the skills they need for the 21st Century. Baker (2003) found that, regarding its integration, technology had (1) increased dialogue between administrators, support staff, and teachers; (2) provided an impetus for school districts to purchase computers and

technology resources; and (3) provided an opportunity to monitor the effective use of technology in instruction.

The advantages of technology use in the classroom were further supported by Johnson (2008). He maintained that the use of websites for lesson planning and the availability of activity templates from the internet provided extended resources for teachers. With these resources, inner-city school children have benefitted from technology in two ways: First, it kept them active in learning, giving them the ability to hone problem-solving skills. Second, it gave them the technological skills to help them in the future.

The development of those technological skills motivated learning in different subject areas. Bethea (2008) found that there was a correlation between students' prior computer skills and the mathematics, science, and computer programming that they subsequently learned in the classroom. He also found that the technology experience enhanced students' self-confidence in technology and learning. In another study on the high school student learning of environmental science, it was found that the use of technology in the curriculum improved self-efficacy, increased interest in the topic, and improved content knowledge (Barnett et al., 2011).

However, generally, technology has not been integrated into education effectively. Heravi (2009) found that the lack of access to computer technology equipment, the need for specialized training in use of computer technology, and teachers' disposition to use technology contributed to the low use of computers for instructional purposes. Jansen (2011) concluded that the integration of technology in schools was far behind the integration in other areas, such as business and medical fields. In response to the call for innovation and creativity in inner city school education, many schools in the 21st century are struggling to integrate technology into the

curriculum and to educate inner-city students for jobs in work-force or for college readiness (Eduventures, 2010; Bowman, 2012).

Main Focus of the Chapter: Technology Integration in an Inner-City School

This chapter is focused on technology integration in the classroom in an inner-city school. The purpose of the study was to examine the usage of technology in an inner-city school in south GA. In-service teachers employed by the school during 2011-2012 were interviewed as well as pre-service teachers who student taught during the FA 2011 term. Qualitative data were collected.

In the study, four inservice teachers (two European Americans and two African Americans, all female) and four preservice teachers (all African Americans, one male and three female) participated in semi-structured interviews. Participants in the study were asked these questions:

- How has technology helped you in strengthening your student's academic learning?
- What type of technological training do you need in order to comfortably integrate technology in your teaching for students' academic learning?

As a Title I school, school Y was provided with technology for teachers and students. Each classroom had at least one computer. Each classroom was also equipped with a Promethean board (an interactive white board). Over-head projectors and TVs were available in a majority of the classrooms. It had been about two years since the smart board technology was added to the classrooms. After installing the equipment, the overall attitude toward technology use in the school was supportive.

Overall Positive Attitudes toward Technology for Educational Use

School Y began to introduce the advanced smart-board technology into the classroom about two years ago. As a result, every classroom has a Promethean board. The teachers seemed to display a welcoming attitude toward the availability of this technology in the classroom and its use in teaching and learning.

During the conversation with the first grade teacher, a European American, Ms. I1, stated that

I do not have a lot of background with technology. I've just used it in the last two years. I've used the Promethean board, but I've had to have so much practice to use it. It helped my children [students] to become better and stronger at using the Promethean board, and of course the computers and everything. If they feel more comfortable with the mouse and the pen on the Promethean board, and things of that sort, it's really made them more excited about learning. It's more interactive and hands on. They really get to be part of the learning. You know instead of just sitting there all the time, they get to do different things.

Ms. I2 is a European American, third grade teacher. She has been teaching for seven years. She was excited about the use of the technology in her teaching. She stated that:

Truly I can tell you technology means we can look for movies and pictures to help [lesson planning and instruction]. Technology helps me show them better in terms of letting them know what a wonderful world it is. It expands their horizons in the classroom. If we run spell check, they see what I see; they immediately go back to check

their spelling. The research is a thrill. You use the computer other than just the library. It helps me in all subject areas.

Ms. I3 was an African American, fifth grade veteran teacher. She has been teaching for 12 years, one year at the fourth grade level and 11 years at the fifth grade level. She had a positive attitude in using technology in her class. She explained that:

[With the use of technology], they [students] become part of the learning process. They themselves can be involved in learning. For example, this morning we were doing some activity on long divisional work on Promethean board. So…. instead of me standing in front of them, they [students] were using the program and that prompted them to do this and prompted them to do that. So…. they take ownership for what they learn. That's important. [Through the activity], they know they are responsible for their learning.

To Ms. I3, the use of technology not only helped to engage students in the learning process, but also helped to train students about their responsibility in the learning process:

They are the only ones knowing they learn something or not. [In other words], I can stand up all day long to present the information to you. At the end of the day, it is your learning. Will you take this with you now and forever? It is up to you [to learn].

Four preservice teachers participated in the study. They all responded to the research questions with affirming attitudes toward using technology in their classrooms. Mr. I4 was a preservice teacher at school Y. By the time of the study, he had been teaching for only a semester

at the school. His attitude toward technology use in his classroom was practical. He expressed that:

> Technology has provided so much for teaching and learning. We can design different activities [and] we can use it to provide instruction in much better ways. The use of the computer is very impressive to my students. A lot of my students were very [interested in learning] different activities. The use of technology helps me teach them [my students] a whole lot better. They understand the materials coming from the computer a lot better than the stuff coming from elsewhere.

Ms. I5, another pre-service teacher commented on technology use in her class that:

> Technology has helped [me] a lot. In the classroom, I use a Promethean board [and] I use PowerPoint presentations. When students pull things from their life experiences, it [technology] helps to explain so many different concepts [so much better]…. Things like evolution [and] the way foci were made….When you have a Promethean board, you have ways to write on them; it helps them remember things [better] when they can see. It is wonderful for them to have a chance to build upon that information [from the Promethean board]. Using technology is great for the teacher and it makes things a lot easier for the students.

Ms. I6 stated that in her conversation with the researcher that:

> Technology is wonderful in the classroom, especially for little kids. You can use smart boards. You can pull different things from different websites for different activities [and] games.

Ms. I7 was an Early Childhood education preservice teacher at the school of the study. She loves technology. She is technology savvy in comparison to the other three preservice teachers in her class. She commented that:

> Technology itself being a strength helps me and my students academically. It makes learning fun. Most of the websites that I use are creative [and] animated. Promethean board is what you can keep their hands on. They can move, drag, [and] they can shape. Not only does it help students academically, it helps teachers with resources. Most teachers all over the country add their stuff to the internet [and] it is a good communication resource for teachers.

Implementation of New Technology: Problems

During the research study, the in-service teachers seemed to exhibit more concern with the use the technology in the classroom, such as curriculum design, instructional-time accommodation, technology support, and faculty and staff training.

As a requirement in alignment with Common Core curricular standards (GPS, 2012), teachers need to integrate technology into their instruction for student academic learning. However, the push for rapid technology implementation overlooked that faculty and staff were not well trained to be comfortable and effective with the use technology in their classrooms.

When we discussed the need for future training with the new technology, Ms. I1 stated that:

I don't think we have been trained properly on all the different technology pieces [available to us]. When not trained, we won't, you know, be able to use it effectively. You know, improper use of technology will take away from the children's learning. We're not properly trained and we are using more instructional time on technology. I would say, definitely, when we start the Common Core [curriculum to meet] Georgia Performance Standards, if we're not going to be properly trained on it [technology], then, I don't think we're going to be able to effectively, you know, meet the new Common Core standards.

With its rigorous standards and requirements for K-12 student academic learning that includes the use of technology for reading, writing, listening, and research, Common Core Standards for the Georgia Performance Standards (GPS, 2012) have been adopted in 2010 and implemented in the State of GA since 2012. With these standards, the demands for technology integration became more prevalent on teachers and students and the need for training to get teachers prepared for that change arose.

During a casual conversation with the principal, the researchers were informed that the school had tried to provide training to faculty and staff at least once per semester. However, after the technology was made available in the classroom for almost two years, Ms. I1 commented that:

We had only one training [session] so far. I myself do not feel I am comfortable to use it. We are supposed to implement it [new Common Core standards] next school year. Even with the student teachers, they had one training [session] with us too. I do not think it is enough for us to feel comfortable to use it for the Common Core.

Ms. I8 was an African American third grade teacher, who also expressed the concern about using technology before the teachers got the training they needed to integrate it into the curriculum:

A lot of it [concern] is professional development. Sometimes, the county or the State introduces certain concepts. You are expected to just go with it. You don't have a lot of formal training on it. You are expected to use it and to use it successfully. So, I think, they [teachers] need training. It could be on Promethean board, it could be on Singapore math training. [The rumor is that] we are going to get that [Singapore] curriculum. I am not sure what exactly that is. It is supposed to be a newer approach to teaching math with technology.

Implementation of Technology in Education: Trends

Teachers interviewed in our study expressed that introducing technology into the classroom is necessary but that the rapid change in technology may cause discomfort and uneasiness for teachers and students alike. Ms. I8 seemed to feel uneasy with the rapid change going on at the school. She was a middle-aged African American, in her 50s. She has been in the

teaching field for about 30 years. She looked forward to retire after so many years of service. She believed that:

Technology is helpful. It strengthens students' academic learning. The Internet has several sites to get resources. With Georgia's new rules, teachers can create their own tests to be more specific to individual students….There are always challenges in technology. They [the county and the State] are also implementing different things. This [her school] is a place for change. As soon as you get comfortable on one thing being done this way, someone else comes up with something else to be done another way.

Ms. I3 was willing to try out new technology; but that may not be true for other teachers:

Now with technology….the thing about that is….I don't have a problem with technology. I don't mind playing with it. If it doesn't work, it doesn't. Then I found something new. But for some teachers, they are afraid of it [technology]….they don't want to break it [computer or Promethean board] …. See…. we have all these boards in the classroom. They have not been used because people did not feel comfortable to use them. They offered professional development training, but I am not sure exactly [how beneficial that is]….they [teachers] may not take advantage of it.

Implementation of New Technology: Issues

The issue related to the technology integration seemed to go back to motivation and the locus of control for teachers. Veteran teachers feared a loss of control in the classroom that was

aggravated by the degree to which technology may be further adopted in future classrooms. Ms. I3 believed that:

> Those are the things with technology. But I think some people are afraid of the loss of control in the classroom and the relinquishing of sources, for example, the Promethean board. With the use of it, the teacher is not the sole source of information any more. Some people don't embrace that idea. That is how I feel. They want to be the person to be in control; they want to be all knowing; with the Promethean Board, you got to let that go; they [students] are responsible for their [own] learning.

Ms. I8 seemed to see the limitations of technology for instruction. She was teaching third grade mathematics at the time of the study. She saw places where technology could not replace hands-on activities. She expressed:

> In math, I see the use of it [technology] in some classes. I see students are very interested in learning when using flip charts, matrices….so they see the connection...I see technology and its greatest good; however, I do have things [activities] that are hands-on. I like hands-on [activities]. I like to see them draw different figures [for example].

When asked about the all online virtual school, Ms. I8 felt that it was impossible in her opinion to teach math all online. She strongly believed that at the age of 8 or 9, students need more hands on activities rather than computers alone.

Pre-service teacher Ms. I6 made similar observation about her writing class. Students in her first grade class were not using computers as often as in other classes. But she is positive about the impact of technology on student learning. She said:

As far as writing, I can see that [hands-on vs. clicking; and hands-on is better]. We did not get to use the computer as much as kids do today. I think that [using more technology in teaching writing] may factor into students' learning. It could be good. It could be a plus for the technology. [I believe] If it is used the right way, technology is wonderful.

Training and Support on the Use of Technology

When asked about what type of training she may need, Ms. I8 expressed the need for technical training such as the need to know how to better use Promethean board. With the training provided once a semester, Ms. I8 did not feel it was sufficient and that she was not comfortable with using it in her classroom.

Technology support seemed to be another area of concern about technology. Ms. I2 explained that in her own experience:

This morning, the Board did not come on. I heard the networking was not working. I do not really depend on it. If I was totally technology illiterate, I would be totally freaked out. I know how to use it and I use it; however, I would like to know more to be more independent. I need to learn trouble shooting a little bit more [and] different programs. We always heard people say "Well, that is not working!" I always think it is good to have a backup plan. Because it is technology, you know, it breaks down.

Analyses

We had eight interviewees. Of these eight, four were in-service, veteran teachers, and four were pre-service teachers. These interviewees provided a range of views. Overall, seven of the eight teachers were supportive of technology in the classroom. One teacher held strong reservations on using technology in the lower elementary classroom, which may be due to the lack of training and support from the school. Of the seven teachers who were supportive of technology use in education, three were in-service teachers, two were European Americans and one an African American. All four of the pre-service teachers, one of whom was a male, were supportive of the use of technology to teach their students; but one of them, a female, addressed some of the negative aspects of its use.

Overall, the results were mixed. They indicated that most teachers were in favor of using technology in the classrooms to teach students. However, there were several reservations expressed, mostly about the lack of training and support with technology and whether the use of technology was even appropriate (i.e., in mathematics).

Discussion

The positive attitude toward technology integration in the classroom in this study was impressive for an inner-city school. To the teachers, and as our theory of cognitive dissonance predicted, the use the technology motivated students to participate and to be responsible for their own learning. In addition, the use of technology opened the doors for teachers to new resources for planning and instruction. The impact of technology goes beyond the classroom. Intel (2010) has found that technology has had a positive impact on transforming inner-city education to better prepare the underserved students in this community for the 21st Century. Technology has

woven together the curriculum, leadership, businesses, teachers, staff, and families. There is now hope that the further implementation of technology will provide an outreach to more families and community where the target school in the study was located. Because parental involvement has been identified as an essential element in children's education, technology has promised the hope that more parents will more easily become involved with inner-city student education.

The positive attitude toward technology exhibited in this study has served to further integrate technology into the curriculum at the target school. The more teachers are comfortable using technology, the more likely they are to integrate technology into their curriculum; the more teachers see the benefits from student engagement in learning, the more the teachers are apt to integrate technology more frequently into their curriculum (Laliberte, 2009; Eduventures, 2010).

Supporting our theory, the teachers in the study commented positively about the benefits of using technology to support student learning and to engage students to become stakeholders in their learning. That was a great happening at this school. Teachers' positive attitudes toward technology had a positive influence on motivating students for academic learning and technological skill development as well (Bethea, 2008). The results of that study indicated that students were motivated about learning with the use of technology. Those interests and motivations need to be further facilitated for academic learning.

Teachers in our study did show hesitation in embracing technology in the classroom for some subject related content areas. Bethea (2008) found that the earlier teachers modeled the use of technology, the more students developed an interest in using it to learn new content. In contrast, negative dispositions expressed by teachers on to the use of technology contributed to the low use of computers for instructional purposes (Heravi, 2009).

With more opportunities available for inner-city schools to have technology resources, such as business charities, grants, NCLB resources, and Title I money, schools are getting various technology resources. So the issue for technology integration in education is a vision that educators need to embrace to better educate their students. On technology in education for K-12, Wickman (2009) commented that "it isn't just inner-city schools and I think it isn't [just] about money. Many schools do not have a tech vision for their site. It is up to the teachers to make it a priority for administration. The money is there for technology but the will to learn it and use it often is not."

The teachers in the study showed not only concerns on technical support but also the integration of technology into specific subject areas. It seems that school administrations need to give more direction on how to integrate technology into the curriculum. Schools need more time for planning, training, and discussion on how to use technology effectively at the administration level.

For administrators, to improve teacher use of technology translates into actions that need to be implemented by its education leadership, and with planning, in-school preparation time, specialized training opportunities, hardware and software, and technical support for the classrooms that are using technology (Heravi, 2009; Brown-Joseph, 2010; Baker, 2003).

Conclusions and Recommendations

Based on the results of the study, the following suggestions are made to improve the technology integration experience for the school, teachers and students:

To begin with, there is a need for technology related professional training. Although the teachers interviewed indicated a supportive attitude to the use of the technology, concerns were expressed by the teachers on the effective use of technology. More training should be offered to

ensure that teachers receive the training needed for them to implement the best instructional practices.

Second, the pedagogical shift from traditional teacher-centered to a more constructive and student-centered approach is necessary. Through the interviews, it was revealed that some teachers were still holding on to the traditional teacher-centered approach toward teaching and learning. With the integration of technology, as Ms. I3 had commented, teachers need to let go of the need to feel completely in control in the classroom. The teacher is no longer the sole source and transmitter of knowledge in the classroom. As our theory predicts, for optimal learning to occur, students must share in the responsibility for their own learning. Technology promises to transform education into this student-centered constructivist approach to improve learning but only if technology in K-12 classrooms has been successfully integrated into the curriculum (Janio, 2007).

Next, the results also indicated that the school was at a crossroads to the further implementation of technology into its curriculum. More discussions are needed between the administration, faculty and staff to go to the next step. There are successful stories and examples across the country to show different models and philosophies for integration of, for example, partnerships, blended learning, and virtual learning (Horg-Webb, 2012; Morris-Young, 2012; Izumi & Alger, 2011).

Technology support was a concern for the teachers of the school. A technology management team at the administration level should be formed to supervise the management of technology support services. An individual or staff person should be designated as the contact person for technology issues. A good support system may reduce the pushback against

technology, may lead to increased comfort levels with technology, and may increase morale at the school among faculty, staff and students.

Lastly, at the early implementation stage of technology in the school we visited, there was no systematic system of assessment to monitor the effective use of the technology at the school. In the long run, a sound assessment system needs to be formed to help and ensure the successful integration of technology into teaching and learning.

Finally, to directly answer the questions we posed in the beginning:

1. How are the resources for technology being used or misused? Answer: The results we obtained were mixed, i.e., technology was use effectively by the teachers who embraced it, but ineffectively by those who feared it. We conclude that with the use of training, the results in the use of technology in the classroom should be more uniformly positive.

2. How does the availability of new technology in inner-city school systems factor into improving the academic achievements of these disadvantaged students? Technology factors into the education of inner-city students very well. Most teachers and students like it. The barrier is not money to purchase and deploy new technology resources, but the skills needed to support the teachers who teach with this technology.

3. and, Are there best practices in the use of this technology that can help close the achievement gap between suburban and inner-city students? First, give students more responsibility for their education; second, train faculty, staff and students in the use of technology deployed in classrooms; and third, and most important, encourage administrators to support the use of technology in the classrooms, to provide regular

training with it, and to let students own more of the responsibility for the learning that

is associated with it.

Future research could follow up on the training and management of technology for inner-

city schools. More importantly, research should focus on how the use of technology can be

translated into increased academic achievement among inner-city school children.

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